The determination of whether the component grains of a rock belong to uniaxial or biaxial doubly-refracting minerals is a point of much importance, which is effected by means of an achromatic condenser inserted in the aperture of the stage below the slide and suitably adjusted so as to converge the rays of light within the grain or crystal. The Nicols having been crossed, the eye-piece is removed, and the eye when held a little distance from the open end of the tube will perceive a dark bar, ring, or cross move across the field as the stage is rotated, if the mineral examined has been cut at a favorable angle. By the form and behavior of these indications the uniaxial or biaxial character is made evident.

Pleochroism (*Dichroism*).—Some minerals show a change of color when a Nicol-prism is rotated below them; hornblende, for example, exhibiting a gradation from deep brown to dark yellow. A mineral presenting this change is said to be pleochroic (polychroic, dichroic, trichroic). To ascertain the pleochroism of any mineral we may remove the upper polarizing prism (analyzer) and leave only the lower (polarizer). If as we rotate the latter, no change of tint can be observed, there is no pleochroic mineral present, or at least none which shows pleochroism at the angle at which it has been bisected in the slice. But in a slice of any crystalline rock, crystals may usually be observed which offer a change of hue as the prism goes round. These are examples of pleochroism. This behavior may be used to detect the mineral constituents of rocks. Thus the two minerals hornblende and augite, which in so many respects resemble each other, cannot always be distinguished by cleavage angles, in microscopic slices. But as Tschermak pointed out, augite remains passive or nearly so as the lower prism is rotated: it is not pleochroic, or only very feebly so; while hornblende, on the other hand, especially in its darker varieties, is usually strongly pleochroic. It is to be observed, however, that the same mineral is not always equally pleochroic, and that the absence of this property is therefore less reliable as a negative test, than its presence is as a positive test.

It would be beyond the scope of this volume to enter into the complicated details of the microscopic structure of minerals and rocks. This information must be sought in some of the works specially devoted to it, a few of which are cited on p. 161.

In his examination of rocks with the microscope, the